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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/269,503	03/29/1999	YASUSHI KANEKO	990348	1116
38834	7590	08/10/2004	EXAMINER	
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP			RUDE, TIMOTHY L	
1250 CONNECTICUT AVENUE, NW			ART UNIT	
SUITE 700			PAPER NUMBER	
WASHINGTON, DC 20036			2883	

DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/269,503	KANEKO ET AL.	
	Examiner	Art Unit	
	Timothy L Rude	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6,8,10-12,14 and 16-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,8,10-12,14 and 16-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims

1. Claims 2 and 18 are amended.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

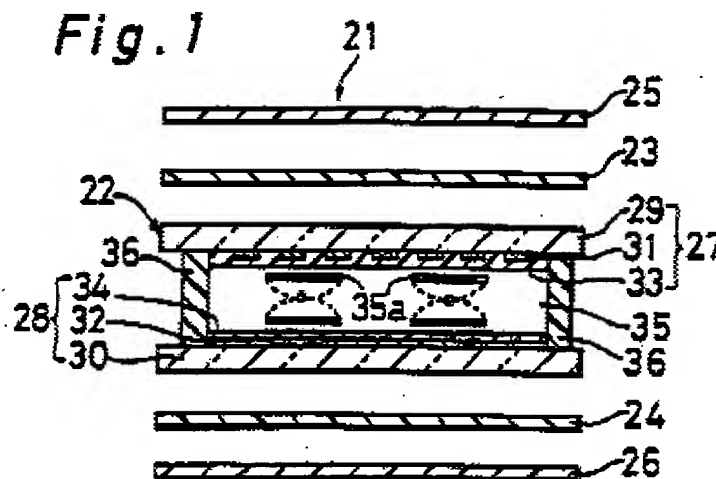
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk et al (Ouderkirk) USPAT 6124971 in view of Nakanishi et al (Nakanishi) USPAT 5,587,821.

As to Claim 1, Ouderkirk discloses the use of a reflective polarizer (col. 16, lines 30-48), a front dichroic polarizer (col. 16, lines 48-49), and a light absorbing member outside the reflective polarizer (col. 17, lines 9-11).

Ouderkirk differs from the claimed invention because he does not disclose the use of a super twisted nematic liquid crystal, a retardation film having relations of $n_x > n_z > n_y$.

Nakanishi discloses in the Summary of the Invention, a super twisted nematic liquid crystal cell having electrodes, 31 and 32, a retardation film, 23, outside second substrate, an absorption-type polarizer, 25, outside the retardation film. Nakanishi also discloses the use of one or more retardation films with the relationship $n_z = (n_x - n_z)/(n_x - n_y)$, where $0 < n_z < 0.5$ (col. 5, lines 10-15) which satisfies $n_x > n_z > n_y$ for all values of $n_z > 0$ to compensate for liquid crystal layer birefringence to obtain excellent display quality in both of the opposing viewing angle directions (Abstract).



Nakanishi teaches that his compensator is applicable to reflective displays (col. 15, lines 26-31). Note that satisfactory compensation of n_x , n_y , and n_z of Nakanishi would result in light compensation that is substantially polarized light during passage through the absorption-type polarizing film, the retardation film, and the super twisted nematic liquid crystal cell, in a state with no voltage applied, as evidenced by the excellent display quality in both of the opposing viewing angle directions.

Nakanishi is evidence that ordinary workers in the art would find the reason, suggestion, or motivation for a super twisted nematic liquid crystal cell having electrodes, a retardation film outside second substrate having relations of $n_x > n_z > n_y$, and a diffuser disposed on the outside surface of the absorption-type polarizer to obtain excellent display quality in both of the opposing viewing angle directions.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk with the super twisted nematic liquid crystal cell having electrodes, a retardation film outside second substrate having relations of $n_x > n_z > n_y$, an absorption-type polarizer outside the retardation film of Nakanishi to obtain excellent display quality in both of the opposing viewing angle directions.

Please note Applicant's added limitations regarding performance and orientation of polarizers and retarders pertain to well known details of configuring said polarizers and retardation films to achieve proper polarization and birefringence compensation in a liquid crystal display device used in either normally black or normally white mode. Clearly those of ordinary skill in the art of liquid crystals at the time the claimed invention was made had the knowledge and motivation to set polarization axes to achieve best contrast in either normally black or normally white mode for a super twisted nematic liquid crystal cell, and they had the knowledge and motivation to set the amount of retardation value of the retardation film to compensate for the retardation of the super twisted nematic liquid crystal layer. These are long-standing routine steps in the

construct of a satisfactory super twisted nematic liquid crystal display device with improved contrast (Applicant's light increasing means). The applied prior art is considered to meet Applicant's added limitations as these details of construction were routine at the time the prior art was disclosed to comprise satisfactory displays with improved contrast (Applicant's light increasing means).

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk in view of Crawford et al (Crawford) USPAT 5867240, Kikuchi et al (Kikuchi) USPAT 5440413, and Arakawa USPAT 5528400.

As to Claim 1, Ouderkirk discloses the use of a reflective polarizer (col. 16, lines 30-48), a front dichroic polarizer (col. 16, lines 48-49), and a light absorbing member outside the reflective polarizer (col. 17, lines 9-11).

Ouderkirk differs from the claimed invention because he does not disclose the use of a super twisted nematic liquid crystal, a retardation film having relations of $n_x > n_z > n_y$.

Crawford discloses in claim 4 a super twisted nematic liquid crystal cell having electrodes (claim 1, A, ii), a retardation film outside second substrate (claim 1, C and 1, E), an absorption-type polarizer outside the retardation film (claim 1, B), and a diffusion

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layer outside the absorption-type polarizer (col. 2, lines 35-38). Crawford also discloses as prior art the use of one or more retardation films with the relationship $n_x > n_z > n_y$ (col. 2, lines 55-63) to compensate for liquid crystal layer birefringence. Use of films with the relationship $n_x > n_z > n_y$ are also disclosed by Kikuchi (col. 8, lines 29-45) and Arakawa (col. 3, lines 19-64). Note that satisfactory compensation of n_x , n_y , and n_z of Kikuchi and Arakawa would result in light compensation that is substantially polarized light during passage through the absorption-type polarizing film, the retardation film, and the super twisted nematic liquid crystal cell, in a state with no voltage applied, as evidenced by the excellent display quality in both of the opposing viewing angle directions.

Accordingly, as evidenced by Crawford, Kikuchi, and Arakawa, ordinary workers in the art would find the reason, suggestion, or motivation for a super twisted nematic liquid crystal cell having electrodes, a retardation film outside second substrate having relations of $n_x > n_z > n_y$, and a diffuser disposed on the outside surface of the absorption-type polarizer, and they are applicable to a reflective type display as evidenced by Nakanishi above.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk with the super twisted nematic liquid crystal cell having electrodes, a retardation film outside second substrate having relations of $n_x > n_z > n_y$, an absorption-type polarizer outside the retardation film of Crawford to improve display performance.

Please note Applicant's added limitations regarding performance and orientation of polarizers and retarders pertain to well known details of configuring said polarizers and retardation films to achieve proper polarization and birefringence compensation in a liquid crystal display device used in either normally black or normally white mode. Clearly those of ordinary skill in the art of liquid crystals at the time the claimed invention was made had the knowledge and motivation to set polarization axes to achieve best contrast in either normally black or normally white mode for a super twisted nematic liquid crystal cell, and they had the knowledge and motivation to set the amount of retardation value of the retardation film to compensate for the retardation of the super twisted nematic liquid crystal layer. These are long-standing routine steps in the construct of a satisfactory super twisted nematic liquid crystal display device with improved contrast (Applicant's light increasing means). The applied prior art is considered to meet Applicant's added limitations as these details of construction were routine at the time the prior art was disclosed to comprise satisfactory displays with improved contrast (Applicant's light increasing means).

4. Claims 2, 4, 6, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk in view of Crawford, Kikuchi, and Arakawa, as applied above, and further in view of Ohnishi et al (Ohnishi) USPAT 5,400,158.

As to Claim 2, the only limitation that differs from claim 1 is the twisted retardation film not disclosed by Ouderkirk in view of Crawford, Kikuchi, and Arakawa.

Ohnishi teaches in Figure 1, example 1, [col. 5, line 25, through col. 7, line 68] the use of a twisted retardation layer, 3, between the absorption-type polarizing film, 1, and the second substrate, 4a, the twist angle and the delta nd value of the twisted retardation film are smaller than that of the super twisted nematic liquid crystal cell to provide a highly producible achromatic color display [better color performance, col. 4, lines 10-15].

Accordingly, as evidenced by Ohnishi, ordinary workers in the art would recognize the benefit of a twisted retardation layer.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk in view of Crawford, Kikuchi, and Arakawa, with the twisted retardation layer of Ohnishi to better compensate the super twisted nematic liquid crystal to provide a highly producible achromatic color display.

Please note Applicant's added limitations regarding performance and orientation of polarizers and retarders pertain to well known details of configuring said polarizers

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and retardation films to achieve proper polarization and birefringence compensation in a liquid crystal display device used in either normally black or normally white mode.

Clearly those of ordinary skill in the art of liquid crystals at the time the claimed invention was made had the knowledge and motivation to set polarization axes to achieve best contrast in either normally black or normally white mode for a super twisted nematic liquid crystal cell, and they had the knowledge and motivation to set the amount of retardation value of the retardation film to compensate for the retardation of the super twisted nematic liquid crystal layer. These are long-standing routine steps in the construct of a satisfactory super twisted nematic liquid crystal display device with improved contrast (Applicant's light increasing means). The applied prior art is considered to meet Applicant's added limitations as these details of construction were routine at the time the prior art was disclosed to comprise satisfactory displays with improved contrast (Applicant's light increasing means).

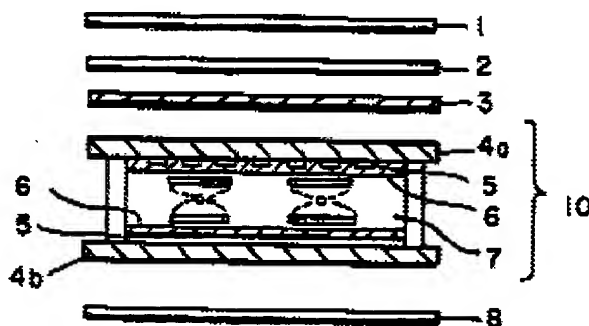


FIG. 1

As to Claims 4 and 6, Crawford, as combined above, discloses the use of various diffusion layers (or sheets) on the viewer side of the display device to improve viewing angle in column 2, lines 25 – 63.

As to Claim 14, Ouderkirk, as combined above, discloses the use of a backlight and an absorbing film between the backlight and the reflective polarizer to provide backside illumination with good contrast in claims 19 and 30.

As to Claim 16, Ouderkirk, as combined above, discloses the use of a diffuser between the first substrate and the reflection-type polarizer to provide diffuse reflection of one polarization and transmission of the other polarization in claim 1.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi, as applied above, and further in view of Minowa et al, USPAT 4697885 (Minowa).

As to Claim 8, Ouderkirk discloses the use of a dichroic polarizer (claim 2), but he does not specify a color polarizing film.

Minowa discloses the use of a color polarizer in Figure 1 and column 1, lines 29 – 38, to provide desired color effects.

Minowa is evidence that ordinary workers in the art would find the reason, suggestion, or motivation for adding a color polarizer to provide desired color effects.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk in view of Crawford and Ohnishi with the color polarizer of Minowa to achieve desired color effects.

6. Claims 10 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi, as applied above, and further in view of Yang et al, USPAT 5847798 (Yang).

As to Claim 10, Ouderkirk discloses the use of an absorbing layer (claims 8, 9, and 10), but he does not specify any color other than black.

Yang discloses the use of a color absorption layer in Figure 7, and column 13, lines 46 – 49, to achieve desired color effects.

Yang is evidence that ordinary workers in the art would find the reason, suggestion, or motivation for adding a color absorption layer to provide desired color effects.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi with the color absorption layer of Yang to achieve desired color effects.

As to Claim 17, Ouderkirk discloses the use of an absorbing layer (claims 8, 9, and 10), but he does not specify any color other than black.

Yang discloses the use of a color absorption layer (other than black) in Figure 7, and column 13, lines 46 – 49.

Yang is evidence that ordinary workers in the art would find the reason, suggestion, or motivation for adding a color absorption layer to provide desired color effects.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi with the color absorption layer of Yang to achieve desired color effects.

Please note Applicant's added limitations regarding performance and orientation of polarizers and retarders pertain to well known details of configuring said polarizers and retardation films to achieve proper polarization and birefringence compensation in a liquid crystal display device used in either normally black or normally white mode.

Clearly those of ordinary skill in the art of liquid crystals at the time the claimed invention was made had the knowledge and motivation to set polarization axes to achieve best contrast in either normally black or normally white mode for a super twisted nematic liquid crystal cell, and they had the knowledge and motivation to set the amount of retardation value of the retardation film to compensate for the retardation of the super twisted nematic liquid crystal layer. These are long-standing routine steps in the construct of a satisfactory super twisted nematic liquid crystal display device with improved contrast (Applicant's light increasing means). The applied prior art is considered to meet Applicant's added limitations as these details of construction were routine at the time the prior art was disclosed to comprise satisfactory displays with improved contrast (Applicant's light increasing means).

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi, as applied above, and further in view of Ebihara et al, USPAT 5990995 (Ebihara).

As to Claim 11, Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi does not disclose the use of a solar cell.

Ebihara discloses the use of a solar cell (Figure 11) column 8, lines 3 – 21 solar cell to convert light energy into electricity.

Ebihara is evidence that ordinary workers in the art would find the reason, suggestion, or motivation for adding a solar cell to convert light energy into electricity.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi with the solar cell of Ebihara to convert light energy into electricity.

8. Claims 12 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi, as applied above, and further in view of Ebihara et al, USPAT 5990995 (Ebihara).

As to Claim 12, Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi does not disclose the use of a solar cell.

Ebihara discloses the use of a solar cell (Figure 11) column 8, lines 3 – 21 to convert light energy into electricity.

Ebihara is evidence that ordinary workers in the art would find the reason, suggestion, or motivation for adding a solar cell to convert light energy into electricity.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi with the solar cell of Ebihara to convert light energy into electricity.

As to Claim 18, Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi does not disclose the use of a solar cell.

Ebihara discloses the use of a solar cell (Figure 11) column 8, lines 3 – 21 to convert light energy into electricity.

Ebihara is evidence that ordinary workers in the art would find the reason, suggestion, or motivation for adding a solar cell to convert light energy into electricity.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Ouderkirk in view of Crawford, Kikuchi, Arakawa, and Ohnishi with the solar cell of Ebihara to convert light energy into electricity.

Please note Applicant's added limitations regarding performance and orientation of polarizers and retarders pertain to well known details of configuring said polarizers and retardation films to achieve proper polarization and birefringence compensation in a liquid crystal display device used in either normally black or normally white mode. Clearly those of ordinary skill in the art of liquid crystals at the time the claimed invention was made had the knowledge and motivation to set polarization axes to achieve best contrast in either normally black or normally white mode for a super twisted nematic liquid crystal cell, and they had the knowledge and motivation to set the amount of retardation value of the retardation film to compensate for the retardation of the super twisted nematic liquid crystal layer. These are long-standing routine steps in the construct of a satisfactory super twisted nematic liquid crystal display device with

improved contrast (Applicant's light increasing means). The applied prior art is considered to meet Applicant's added limitations as these details of construction were routine at the time the prior art was disclosed to comprise satisfactory displays with improved contrast (Applicant's light increasing means).

Response to Arguments

9. Applicant's arguments filed on 02 April 2004 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

- (1) $n_x > n_z > n_y$ of the prior art is not the same as of $n_x > n_z > n_y$ of the instant Application.
- (2) Nakanishi does not disclose a reflection-type polarizing film.
- (3) Prior art does not teach a retardation film and a reflection-type polarizing film constitute a reflection light increasing means.
- (4) Prior art does not disclose a background that becomes metallic silver in appearance.
- (5) Prior art does not teach increasing light from the reflection-type polarizing film.
- (6) Applicant's structure did not exist previously.
- (7) Reflecting light is not a matter of lexicography.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Applicant provides no reason (no Argument) as to why $n_x > n_z > n_y$ is not the same as Applicant's $n_x > n_z > n_y$. Examiner believes the prior art does in fact teach Applicant's $n_x > n_z > n_y$ with proper motivation to obtain excellent display quality (Applicant's light increasing means).

(2) It is respectfully pointed out that the primary reference, Ouderkirk, discloses a reflection-type polarizing film, per rejections above.

(3) It is respectfully pointed out that Applicant's "reflection light increasing means" is a matter of lexicography. Prior art teaches the use of a reflective polarizer to reflect light, and prior art teaches the use of a retardation film to improve display quality, i.e., contrast and brightness (Applicant's reflection light increasing means).

(4) It is respectfully pointed out that prior art discloses the structure that Applicant's enabling disclosure confirms to perform such that the background becomes metallic silver in appearance.

(5) It is respectfully pointed out that prior art teaches increasing light from the reflection-type polarizing film by way of increasing light as a function of increasing contrast ratio. Please note that contrast ratio is given by the magnitude of light in the bright state divided by the magnitude of the light in the dark state. The teachings pertain to improving contrast by improving light reflection as opposed to making the dark state more black. Therefore, they teach Applicant's brighter display and/or increased reflection.

(6) It is respectfully pointed out that, although examiner does not concede no previous existing identical structure, the motivated combination renders Applicant's structure obvious.

(7) It is respectfully pointed out that increasing reflecting light is a matter of lexicography relative improving contrast by way of improving light transmission (see relationship explained in (5) above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude
Examiner
Art Unit 2883



Frank G. Font
Supervisory Patent Examiner
Technology Center 2800